
Space Weather Forecast

Issued on Tuesday, 20 February 2024 at 13:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Ongoing chance of Minor Solar Radiation Storms (R1). Slight chance of Minor Geomagnetic Storm (G1) Friday 23 February.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has remained low over the UTC day of Monday 19 February with X-ray flares confined to Common-class, peaking with a flare at 20/1240UTC from a large sunspot region near the eastern solar horizon.

There are four sunspot regions on the facing side of the Sun, with the nominal threat of flares dominated by a large area arriving in the northeast. Other sunspots were relatively magnetically simple and largely unchanged in the 24 hours.

At the time of writing, no new Earth-directed Coronal Mass Ejections (CMEs) were noted.

Solar Wind / Geomagnetic Activity: Solar winds were reflective of a slow solar wind regime. The solar wind speed was steady at background levels. The number of particles in the solar wind were between average and slightly below average. The associated magnetic field was smooth and stable within normal levels, with a north-south component mostly co-aligned with Earth's field.

The net result of the above solar wind measures was for provisionally quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: Solar radiation was just above resting background levels but on a continuing declining trend, with no new enhancements having been seen since 16 February.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is most likely to continue, but with a daily chance of rising to Moderate. This chance is rated roughly constant through the four days, with arriving eastern solar horizon regions roughly compensating for western losses.

Solar Wind / Geomagnetic Activity: Solar wind speeds are expected to remain at ambient levels, however interaction with a coronal hole late on the 23rd February which may cause solar wind speeds to rise to Slightly elevated or elevated levels.

Geomagnetic activity is forecast to be mainly Quiet, with a Slight Chance of active or perhaps G1/Minor Geomagnetic storm intervals late on the 23rd February

Energetic Particles / Solar Radiation: Solar radiation levels will continue to gradually ease to resting background, but with a slight chance of further enhancement until around midweek UTC should any appropriate flares occur from a sunspot group just over the limb or from the large (narrowly) front-sided region approaching it.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	15
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	35	35	35	35
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	2	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)